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Qing

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(54) **STORM DOOR PUSH OR TURN LOCK METHOD OF USING SAME**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/427,023**

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Related U.S. Application Data

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(51) **Int. Cl.**
E05C 3/16 (2006.01)

(52) **U.S. Cl.** **292/226**; 292/336.3

(58) **Field of Classification Search** 292/336.3, 292/126, 226
See application file for complete search history.

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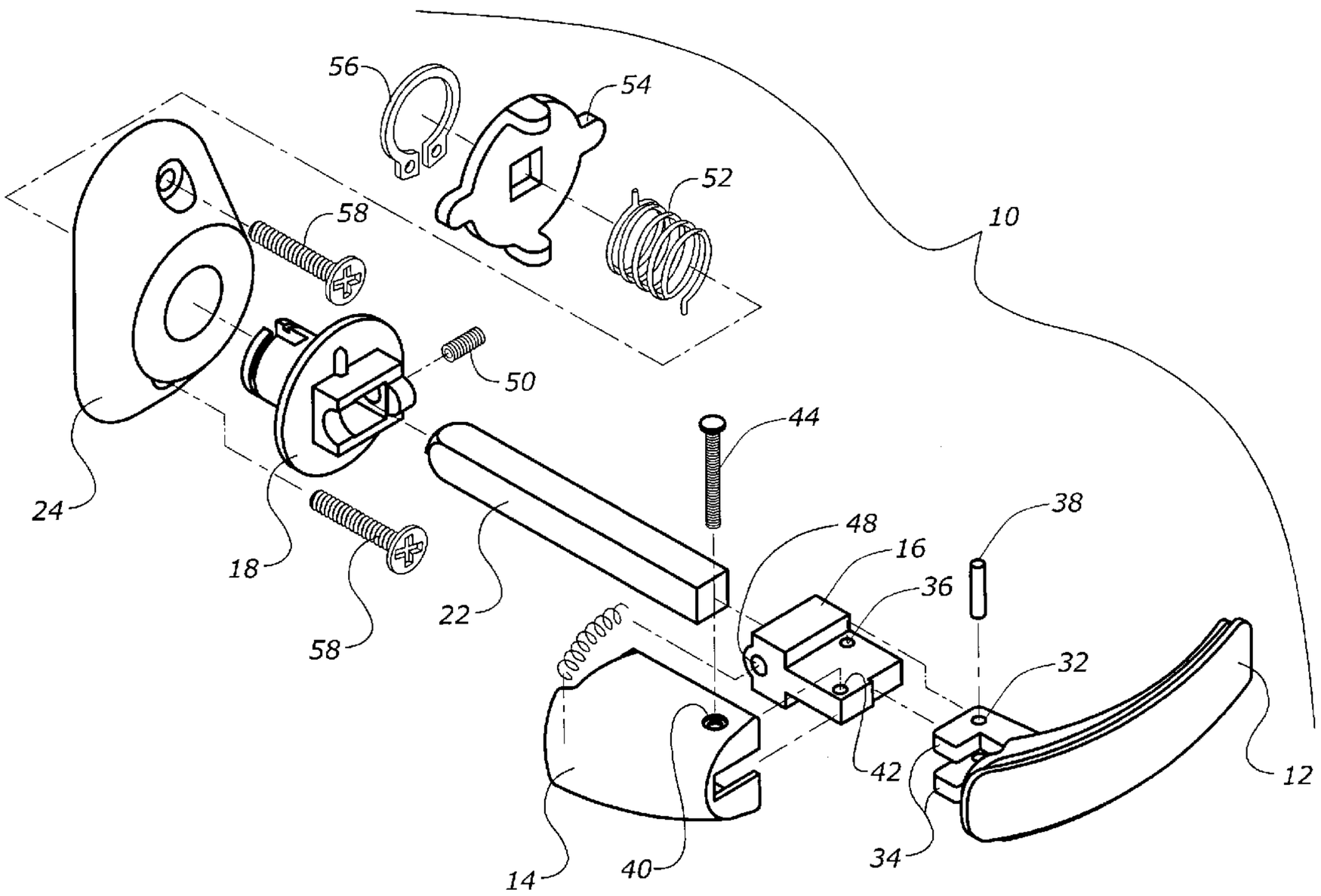
(57) **ABSTRACT**

A latch mechanism for a storm door including a nose and a handle operably connected to a spindle that is operatively connected to an exterior handle. The handle and nose are rotatably secured to a linker that is secured to the spindle. The handle includes a cam that, upon rotation, presses against the upper portion of the nose. This causes the nose to rotate on the linker and retracts the front of the nose away from the catch on the interior wall or door jamb.

The spindle is inserted through a spindle cylinder that is in operative contact with the linker assembly and rotatably secured to the body of the storm door by a mounting bracket. The spindle cylinder allows the handle, nose and linker to be rotated, thereby causing the nose to swing away from the catch.

15 Claims, 5 Drawing Sheets



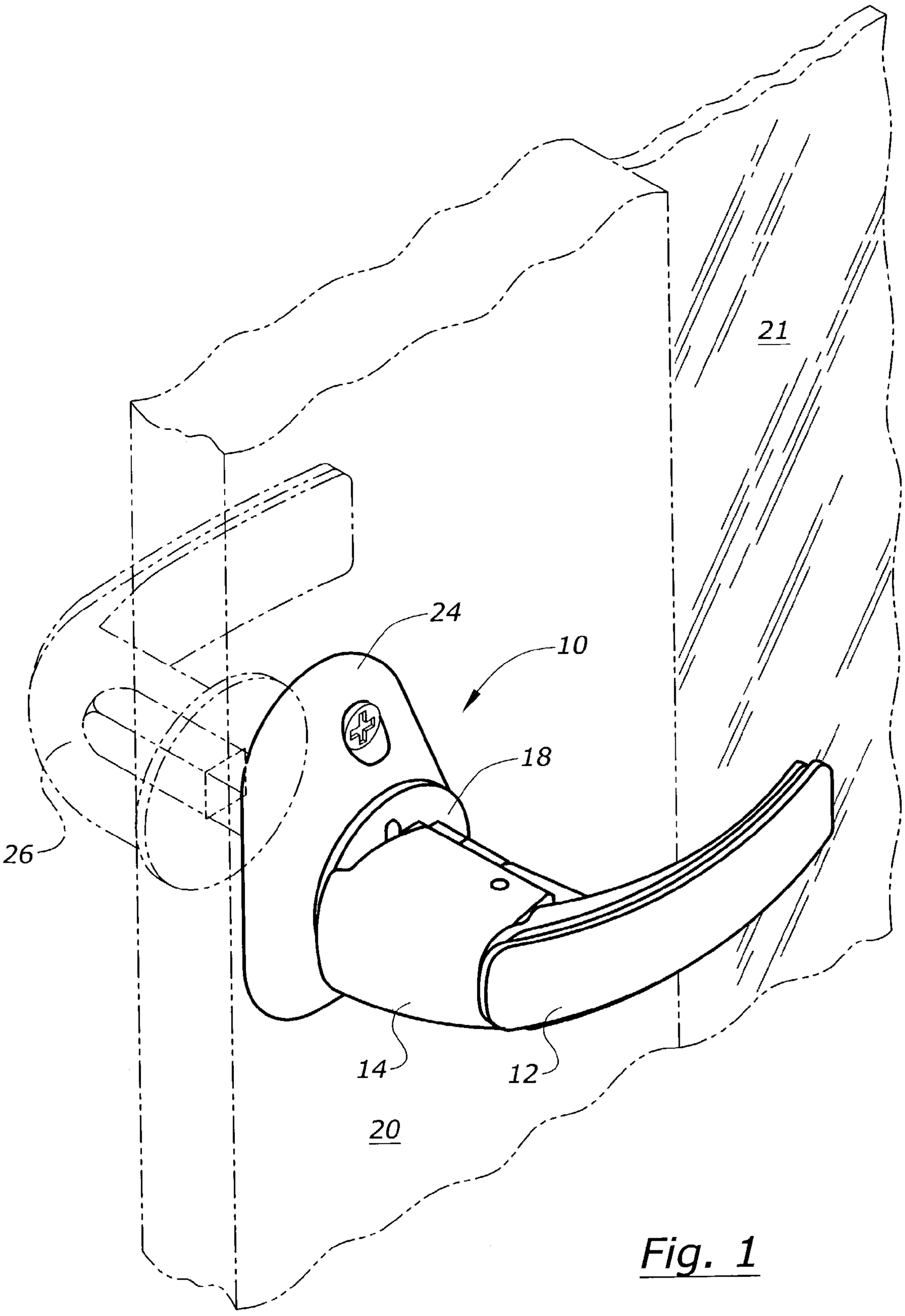


Fig. 1

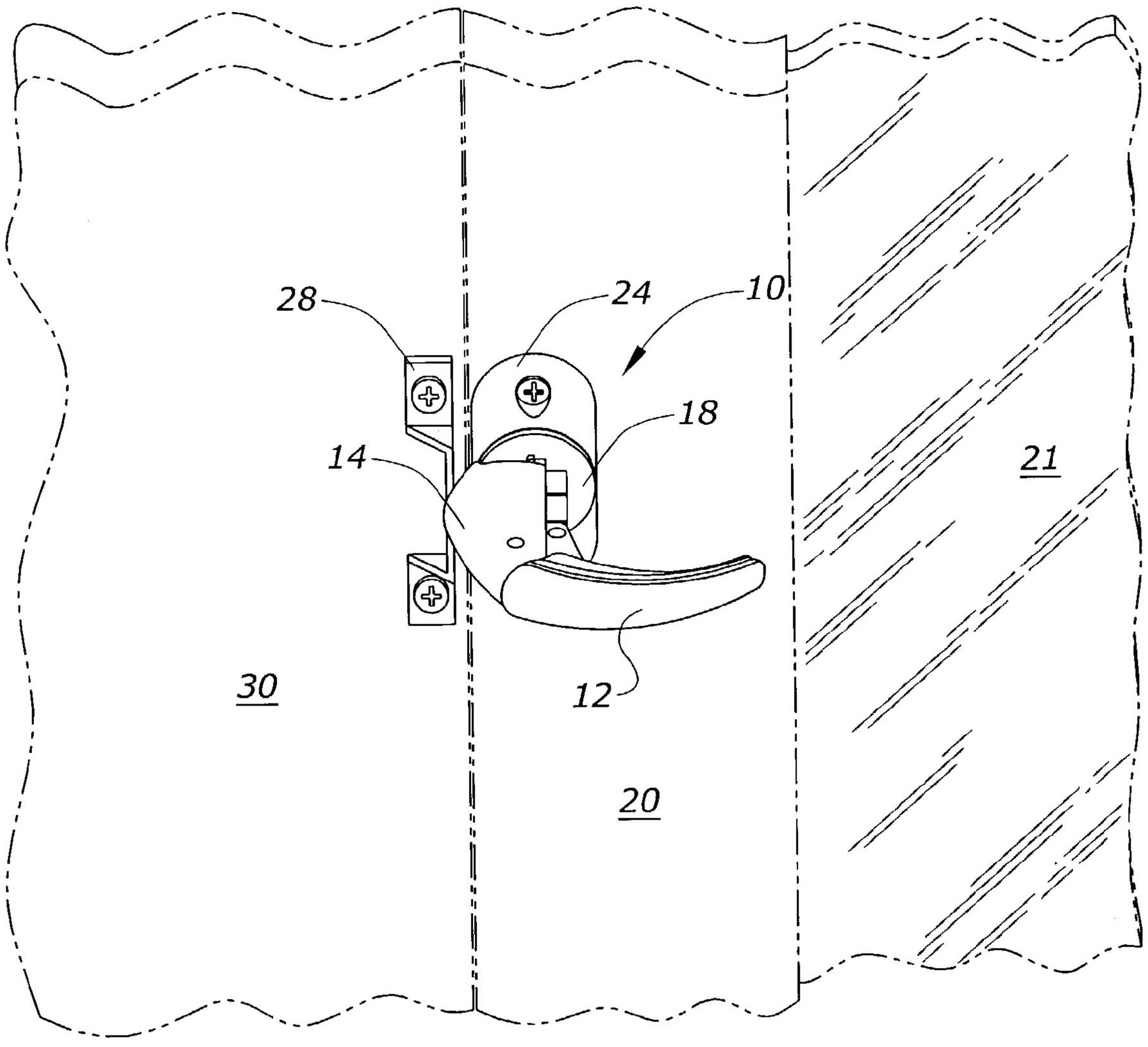


Fig. 2A

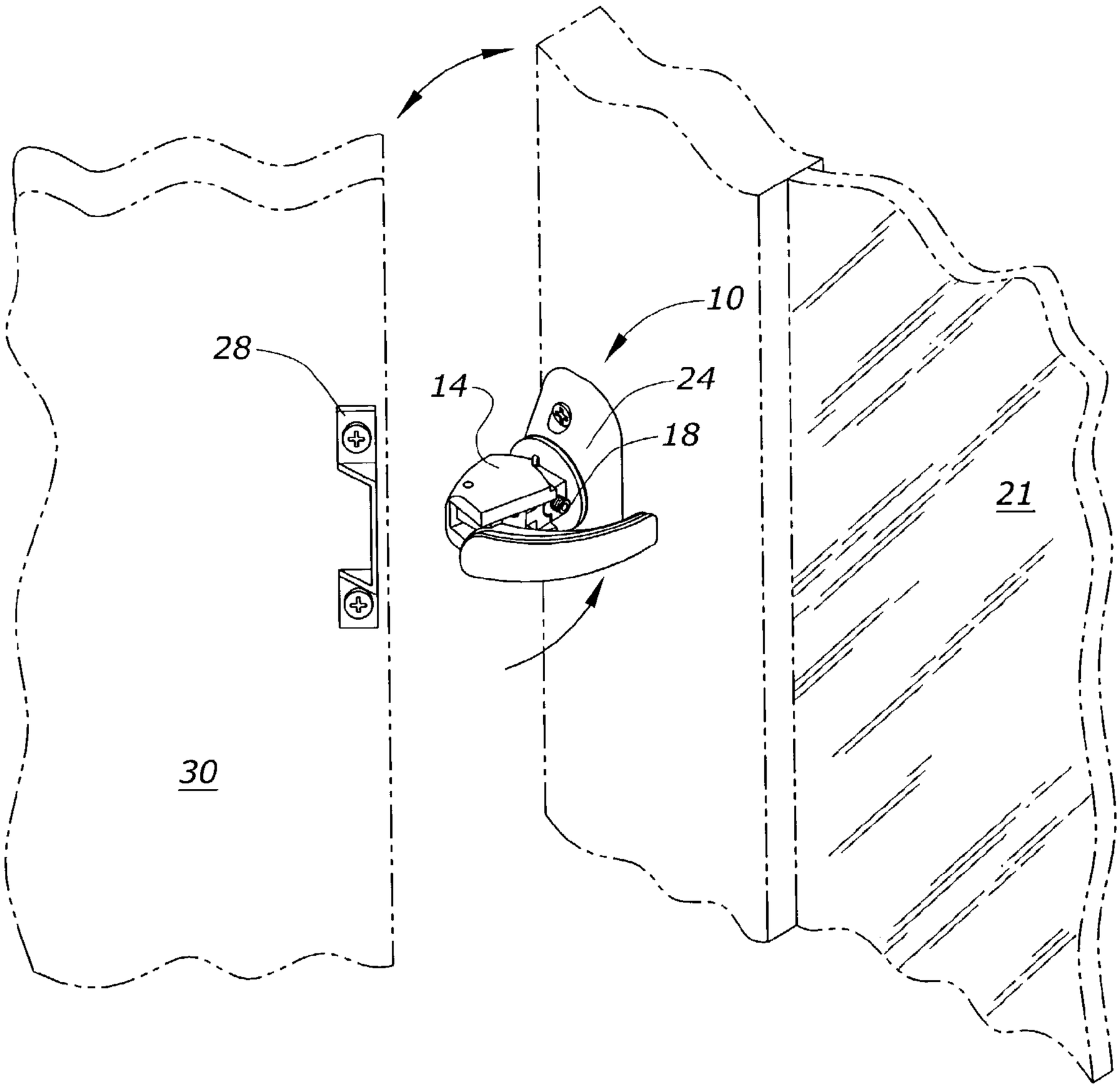


Fig.2B

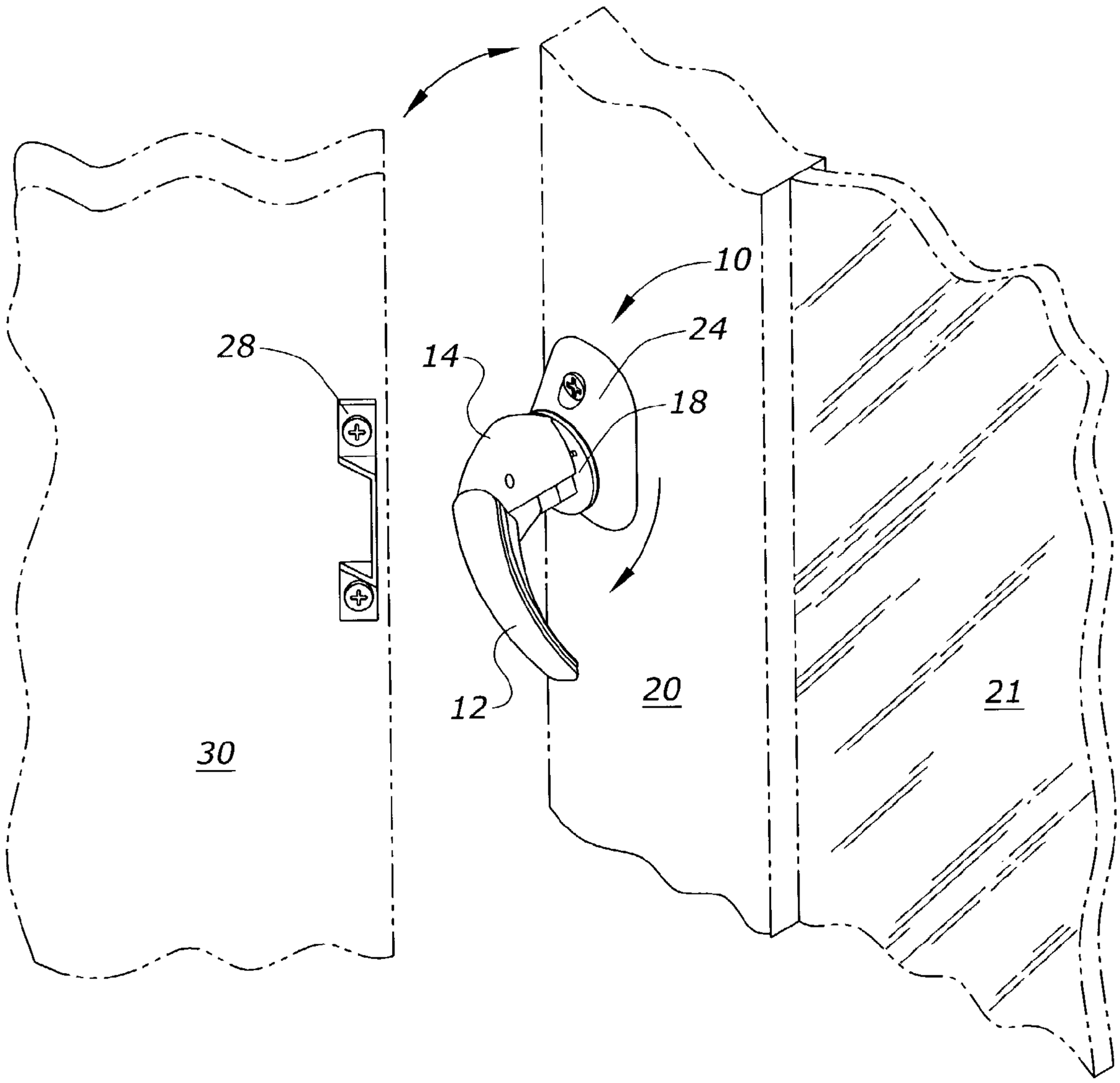
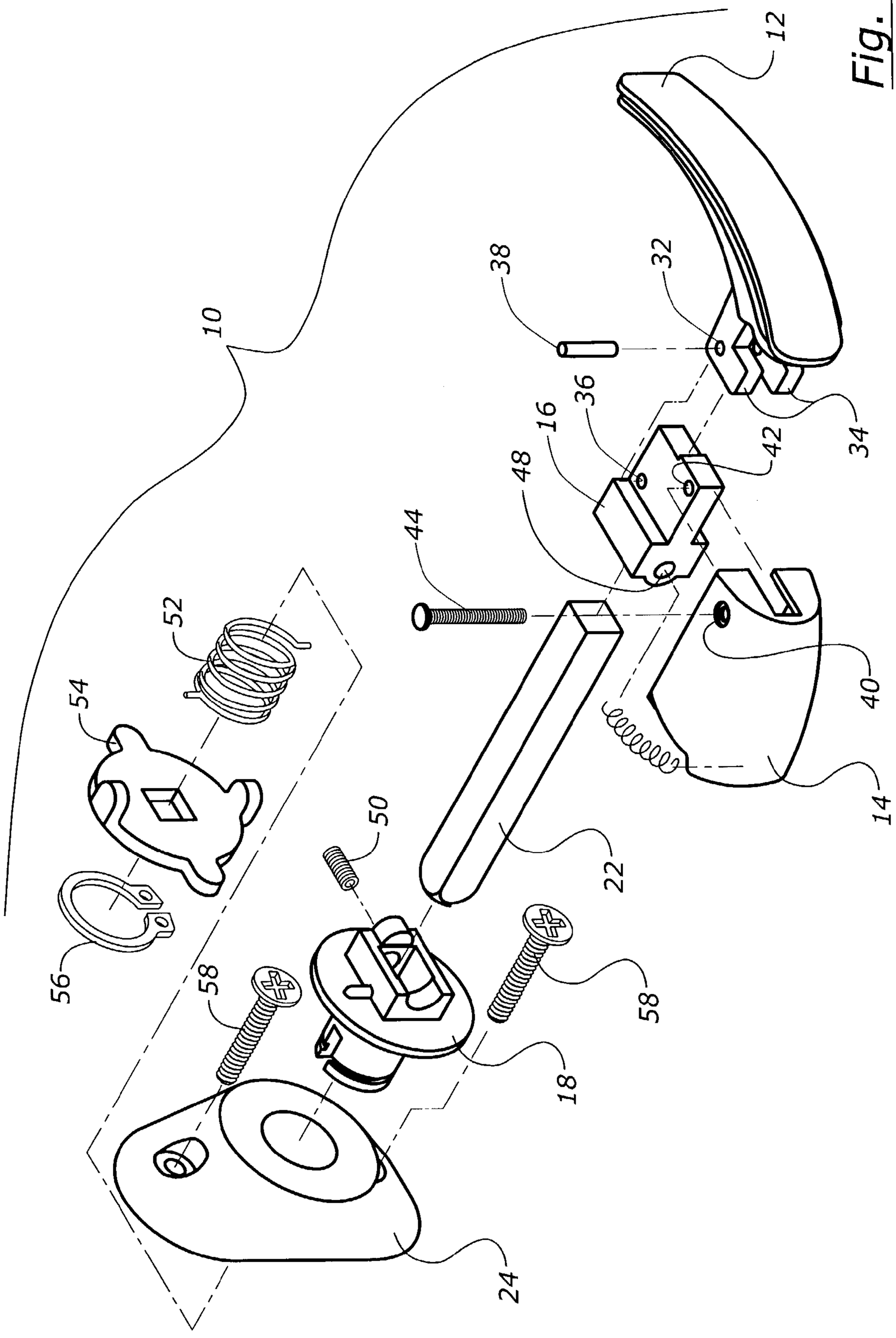


Fig.2C

Fig. 3



STORM DOOR PUSH OR TURN LOCK METHOD OF USING SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority under 35 U.S.C. § 119 of a Provisional Application, U.S. Ser. No. 60/376,663 filed Apr. 30, 2002, which application is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a storm door including a latch mechanism and more specifically to a latch mechanism that includes a securing member which may be actuated by either pushing on or turning a handle.

2. Problems in the Art

Storm doors are typically mounted in the same door jamb as the main full size door. The thickness of the main door leaves little room for a storm door, thus space is at a premium.

Storm doors typically have either an internal latch mechanism that is actuated by turning a knob or handle or an external latch mechanism that is of the push button/handle variety. Prior attempts to combine these two styles of latching mechanisms have included modifications to the turning bar and bolt of an internal style latch mechanism. Such attempts are shown and discussed in U.S. Pat. No. 5,947,535 to Baker. Baker allows the user to open the door by pushing in or pulling out the entire handle assembly. This can be cumbersome in a storm door setting where space is of the essence.

Securing a latch mechanism to the exterior portions of a storm door allows the storm door to remain relatively thin. A thin storm door can more easily fit into the door jambs of most homes. Moreover, the use of latch mechanisms on the exterior of a storm door also eases installation and repair.

Currently such latch mechanisms typically include a handle which is pushed in to activate the latching mechanism. To the contrary, the handles or knobs on most typical full size doors are turned. In an urgent situation, the ability of the storm door exterior latch to be actuated by either turning a handle or pushing a handle may avoid confusion and save precious time. It is therefore desirable to provide an exterior latch mechanism for a storm door that can be actuated by either pushing or turning the handle.

FEATURES OF THE PRESENT INVENTION

A general feature of the present invention is the provision of a latch mechanism that overcomes the problems in the prior art.

A further feature of the present invention is the provision of a latch mechanism that can be actuated by turning a handle.

Another feature of the present invention is the provision of a latch mechanism that can be actuated by pushing the handle.

A further feature of the present invention is the provision of a storm door with a latch mechanism that can use a conventional spindle and bolt to connect to an exterior turn-style handle.

A further feature of the present invention is the provision of a latch mechanism that can be operated in the space required for a typical storm door.

Another feature of the present invention is the provision of a latch mechanism that allows the storm door to remain as thin as possible.

A still further feature of the present invention is the provision of a latch mechanism that can be secured to the storm door without the need for a mortise.

These, as well as other features and advantages of the present invention, will become apparent from the following specification and claims.

BRIEF SUMMARY OF THE INVENTION

The present invention generally comprises a storm door with a latch mechanism including a handle and a nose. The handle of the present invention is operably connected to a spindle that is operatively connected to an exterior handle. Upon turning either of the handles or pushing the interior handle, the nose is retracted or slid away from the catch secured to the interior wall or door jamb and the door may be opened.

Initially, the handle and nose are rotatably secured to a linker. Rotation of the handle about the securement point on the linker occurs when a user pushes in on the handle. The handle includes a rotation arm or cam that, upon rotation, presses against the upper portion of the nose. This causes the nose to rotate about its point of securement on the linker and retracts the front of the nose away from the catch on the interior wall or door jamb.

The linker is also secured to a spindle. The spindle is inserted through a spindle cylinder. The spindle cylinder is in operative contact with the linker assembly and rotatably secured to the body of the storm door. The spindle cylinder allows the handle, nose and linker to be rotated, thereby causing the nose to swing away from the catch. A conventional turn-style handle can be operatively connected to the other end of the spindle in a conventional manner.

In this way, the present invention provides a user with a handle that may be either turned or pushed to disengage the nose from the doorjamb, allowing the door to be opened. These features of novelty and various other advantages that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings, wherein like reference numerals indicate corresponding structure throughout the several views.

FIG. **1** is a perspective view of the latch mechanism of the present invention as installed on a conventional storm door.

FIG. **2**A is a partial frontal perspective view of the latch mechanism of the present invention as installed and in the closed position.

FIG. **2**B is a partial frontal perspective view of the latch mechanism of the present invention as installed and in the open-pushed position.

FIG. **2**C is a partial frontal perspective view of the latch mechanism of the present invention as installed and in the open-turned position.

FIG. **3** is an exploded view of the preferred embodiment of the latch mechanism of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will be described as it applies to its preferred embodiment. It is not intended that the present invention be limited to the described embodiment. It is intended that the invention cover all modifications and alternatives which may be included within the spirit and scope of the invention.

Referring now to the drawings, wherein like reference numerals and letters indicate corresponding structure throughout the several views, and referring in particular to FIG. **1**, the latch mechanism **10** of the present invention is shown. Generally, the latch mechanism **10** includes a handle **12** and a nose **14** rotatably mounted to a linker **16** that is secured to the top of a spindle **22**. The spindle **22** is rotatably mounted in a spindle cylinder **18** that is secured to the door **20**. The door **20** is preferably an aluminum or composite storm door that may include a screen or glass section **21** as is conventional in the art. All of the parts of the latch mechanism **10** can be made of aluminum or any other durable material, such as metal, plastic or wood.

The spindle **22** passes through the door **20** and is secured to a conventional handle **26** or another latch mechanism **10** as desired. As is shown in FIG. **2**A, the latch mechanism **10** is secured to the door **30** such that the nose **14** contacts a catch **28**. This is the closed position. The latch mechanism **10** is preferably made of several parts as is shown in FIG. **3**. Each part shall now be discussed.

The handle **12**, shown in FIG. **3**, preferably includes a handle pivot hole **32** and a handle cam **34**. The handle pivot hole **32** corresponds to a hole **36** in the linker **16**. The handle **12** is rotatably secured to the linker **16** about the holes **32**, **36** by a pin **38** or other securing device.

The nose **14** preferably includes a nose pivot hole **40**. The nose **14** is thereby rotatably secured to the linker **16** by a pin **44** or other securing device that passes through the nose pivot hole **40** as well as the corresponding hole **42** in the linker **16**. In this manner the nose **14** and the handle **12** can rotate about a pair of generally vertical axis on the linker **16**. Rotating the handle **12** on the linker **16** in this manner occurs when a user pushes the handle **12**. This causes the handle cam **34** to contact the upper inside portion of the nose **14**, pivoting the nose **14** about the nose pivot hole **40** and retracting the front of the nose **14** from the catch **28** on the interior wall **30** or doorjamb. In this manner, the door **20** is opened as shown in FIG. **2**B. When the user releases the handle **12**, a spring **46** pushes the nose **14** and the handle **12** back into their original positions. The spring **46** is secured to the inside of the nose **14** and to a hole **48** on the linker **16**. Alternatively, a pin (not shown) may be inserted into hole **48** and used to secure the spring **46**.

The linker **16** also includes a spindle receiving notch (not shown). A spindle **22** is inserted into the spindle receiving notch and secured in place by a screw, glue, or any other conventional means. A spindle cylinder **18** is then placed on the spindle **22**. The spindle **22** fits through a corresponding spindle hole in the spindle cylinder **18**. The fit should be tight enough to hold the spindle **22** in place. The spindle **22** may rotate when secured in the spindle cylinder **18**.

The spindle cylinder **18** is secured in place just below the linker **16** and may interlock with the linker **16** through corresponding notches shaped into the sides of the respective parts. The spindle cylinder **18** is secured in place by tightening a screw **50** or other securement device through a corresponding hole.

The spindle cylinder **18** is secured to the door by a mounting bracket **24**. A spring **52** is then placed around the base of the spindle cylinder **18** and on the underside of the mounting bracket **24**. A spring retaining member **54** is then placed over the spring **52** and around the spindle **22**. The spring retaining member **54** includes a pair of ears bent to contact corresponding tabs on the spring **52**. In this manner, the spring force is transferred to provide resistance to the turning of the spindle **22** and to return the spindle **22** and the handle **12** to their original positions. A retaining clip **56** is finally placed in the retaining groove on the spindle cylinder **18** to secure the spindle cylinder **18** in place.

When secured, the spindle cylinder **18** allows the user to rotate the handle **12**, nose **14** and linker **16** to turn the nose **14** away from the catch **28** and the door jamb or interior wall **30**. This allows the user to open the door **20** as is shown in FIG. **2**C.

In this manner it can be seen that the latch mechanism **10** of the present invention allows a user to either push the handle **12** (FIG. **2**B) or turn the handle **12** (FIG. **2**C), removing the nose **14** from an engaged or closed position (FIG. **2**A) with the doorjamb or interior wall **30**, to open the door.

A preferred embodiment of the present invention has been set forth above. It should be understood by one of ordinary skill in the art that modifications may be made in detail, especially in matters of shape, size and arrangement of parts. Such modifications are deemed to be within the scope of the present invention which is to be limited only by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A push or turn latch mechanism for a screen door, the latch mechanism comprising:

a spindle having an first end and an opposite second end;

a linker attached to the first end of the spindle;

a handle pivotally mounted to the linker about a first vertical axis, the handle including a cammed portion;

a nose pivotally mounted to the linker about a second vertical axis wherein rotation of the handle about the first vertical axis causes the nose to rotate about the second vertical axis;

a spindle cylinder engaging the spindle for rotation about a third horizontal axis, wherein pivoting the handle about the third horizontal axis causes rotation of the spindle about the third horizontal axis.

2. The latch mechanism of claim **1** wherein a spring is positioned between the nose and the linker.

3. The latch mechanism of claim **1** wherein the handle is pinned to the linker.

4. The latch mechanism of claim **1** wherein the nose is pinned to the linker.

5. The latch mechanism of claim **1** wherein the spindle is secured to the spindle cylinder with a screw.

6. The larch mechanism of claim **1** wherein a spring is operatively connected to the spindle.

7. The latch mechanism of claim **1** further comprising a second handle operatively connected to the second end of the spindle.

8. A screen door assembly including an easy to use latch mechanism, the screen door comprising:

a screen door pivotable about a vertical axis from a closed position to an open position; and

a latch assembly mounted to the screen door, the latch assembly including a spindle passing through the screen door and having an interior end opposite an exterior end, a linker attached to the interior end of the

spindle, a handle pivotally mounted to the linker about a vertical axis, a nose pivotally mounted to the linker about a vertical axis, a mounting bracket, a spindle cylinder secured to the mounting bracket for rotation about a horizontal axis and having an opening through which the exterior end of the spindle passes, wherein the handle is rotatable about either the vertical axis or the horizontal axis.

9. The screen door assembly of claim **8** further comprising a handle operatively secured to the spindle on the exterior of the storm door.

10. A push or turn latch mechanism for a screen door, the latch mechanism comprising:

a spindle having a first end and an opposite second end;

a linker attached to the first end of the spindle;

a handle pivotally mounted to the linker about a first axis, the handle including a cammed portion;

a nose pivotally mounted to the linker about a second axis wherein rotation of the handle about the first axis causes the cammed portion to contact the nose and rotate the nose about the second axis;

a spindle cylinder engaging the spindle for rotation about a third axis, wherein pivoting the handle in a direction transverse to the first axis causes rotation of the spindle about the third axis;

wherein the spindle is secured to the spindle cylinder with a screw.

11. The latch mechanism of claim **10** wherein a spring is positioned between the nose and the linker.

12. The latch mechanism of claim **10** wherein the handle is pinned to the linker.

13. The latch mechanism of claim **10** wherein the nose is pinned to the linker.

14. The latch mechanism of claim **10** wherein a spring is operatively connected to the spindle.

15. The latch mechanism of claim **10** further comprising a second handle operatively connected to the second end of the spindle.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,055,873 B2
APPLICATION NO. : 10/427023
DATED : June 6, 2006
INVENTOR(S) : Qing, Wu Feng

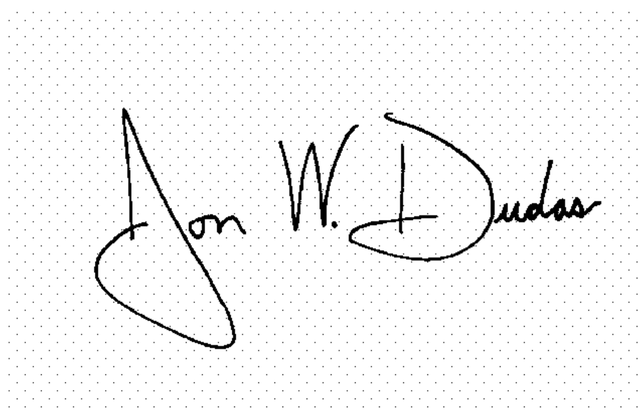
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the title page item (54) and col. 1, line 1,
STORM DOOR PUSH OR TURN LOCK --AND--

Col. 4, claim 6, line 55:
6. The "larch" --latch-- mechanism of claim 1 wherein a spring is

Signed and Sealed this

Eighth Day of August, 2006



JON W. DUDAS
Director of the United States Patent and Trademark Office